



Effect of Supplementation of Quail Egg on Pre Weaning Growth Performance and Livability in Large White Yorkshire Crossbred Piglets

A. Karthikeyan*, R.S. Kathiravan, M. Murugan, P. Tensingh Gnanaraj and D. Balasubramanyam

Post Graduate Research Institute in Animal Sciences,

Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam, Chengalpattu (Tamil Nadu), India.

(Corresponding author: A. Karthikeyan*)

(Received: 05 July 2024; Revised: 14 August 2024; Accepted: 10 September 2024; Published: 15 October 2024)

(Published by Research Trend)

ABSTRACT: The success of pig farming, particularly in organized setups, depends not only on superior genetic groups but also on optimal nutritional interventions. The pre-weaning phase is critical in determining the survival rate and future growth performance of piglets. Quail eggs, known for their rich nutritional profile, offer a potential supplement to improve early-life nutrition in piglets. Considering this, the study aimed to assess the effect of quail egg supplementation on pre-weaning growth and livability in Large White Yorkshire (LWY) crossbred piglets under organised farm condition. A total of 30 piglets from three sows were randomized into two groups: control group without supplementation and treatment group supplemented with quail egg at 1% of body weight every alternate day from day 4 to day of weaning (42nd day) and body weight was recorded on every fourth day interval along with livability. The study revealed significant differences in growth performance, with the quail egg-supplemented group achieving an average weaning weight of 8.50 ± 0.59 kg compared to 7.20 ± 0.52 kg in the control group. Livability was also higher in the treatment group (96%) compared to the control group (83%). The study concludes that quail egg supplementation enhances pre-weaning growth performance and increases the livability during the critical pre-weaning period in piglets at a cost-effective rate.

Keywords: Quail egg, supplementation, growth performance, livability piglets.

INTRODUCTION

The pig farming in India has embraced exotic purebreds and their crossbreds for their improved production outputs. Genetic improvements alone, however, are insufficient for maximizing productivity. The pre-weaning phase is a highly vulnerable period in the life of piglets, with high mortality rates often resulting from inadequate nutrition, disease, and environmental stress. To enhance the survivability and growth rates during this period, optimal nutritional strategies are essential (Panzardi *et al.*, 2013). While conventional approaches involve sow milk supplementation, alternative nutrient-rich supplements like quail eggs, which are high in protein, essential amino acids, vitamins, and minerals, may provide additional benefits. Quail eggs have been identified as a superior nutrient source compared to chicken eggs, containing higher proportions of vital nutrients like protein, riboflavin, selenium, and choline (Tunsaringkarn *et al.*, 2013). Quail eggs contain approximately 13.1 grams of protein per 100 grams, higher than the 12.6 grams found in chicken eggs (Ali and Abd El-Aziz 2019). Quail eggs are a rich source of essential fatty acids, in addition to essential fatty acids, quail eggs are also rich in phospholipids, which play an important role in cell membrane integrity and metabolic regulation (Emtyazjoo and Chamani 2022). Pre-weaning mortality is a significant issue in pig farming,

often caused by malnutrition, infections, and environmental stress (Novotni-Dankó *et al.*, 2015). In this study, we explore the effects of quail egg supplementation on the growth performance and livability of LWY crossbred piglets during the pre-weaning phase.

MATERIAL AND METHODS

Experimental design. This study was conducted on a total of 30 LWY crossbred piglets from three sows housed in an organized farm under standard managemental conditions. Piglets were randomly allocated within each litter separated into two groups: the treatment group supplemented with quail egg (n=15) and the control group (n=15). Randomization was performed with the piglets in both groups had an initial body weight of approximately 1.0 ± 0.05 kg. The experiment lasted for 42 days, from birth to weaning. The piglets under the treatment group received 1% of their body weight in boiled quail egg on every alternative day from day 4 to day of weaning (42nd day), while the piglets in the control group did not receive any supplementation. Owing to importance of colostrum feeding, interventions during initial three days was with hold in the treatment group. Care was given to all the three litters so that the environmental conditions remains common throughout the trial period.

Feeding and management. All suckling piglets and their dam were reared under uniform management and feeding conditions. Both groups were maintained on a standard diet as per farm practices, with piglets having access to sow milk throughout the study. Quail eggs locally sourced from the poultry breeding unit at Post Graduate Research Institute in Animal Sciences were boiled to devoid of any anti nutritional factors in raw egg and fed to the piglets as a supplement. The control group was solely reliant on sow milk. No other nutritional interventions were introduced during the study period.

Growth, livability and economics. Growth performance was measured by recording the body weight on every four days interval, starting from Day 4 until the weaning at day 42. The pre-weaning average daily gain (ADG) was calculated for both groups. Livability rates were recorded by observing the number of piglets that had survived from initial to the end of the trial period. Economics on supplementation of quail egg was calculated by cost gained due to the additional weight gain in supplemented group to that of the total cost towards the quail eggs supplemented.

Statistical analysis. The data were subjected to statistical analysis using a t-test to compare the means between the control and treatment groups.

RESULTS AND DISCUSSION

Growth performance. The piglets in the quail egg supplemented group exhibited an average weaning weight of 8.50 ± 0.59 kg, while the control group had an average weaning weight of 7.20 ± 0.52 kg (Fig. 1). There exist an overall increase in pre-weaning body weight performance approximately 18% higher in the treatment group than the control group. The growth trends indicate a consistent increase in body weight in the supplemented group, particularly during the last ten days of the weaning, where significant ($p < 0.05$) differences were observed between the groups (Table 1). The high-quality proteins in quail eggs, particularly essential amino acids such as lysine and methionine, are likely contributors to the observed growth improvements (Tunsaringkarn *et al.*, 2013). These amino acids are critical for muscle development and tissue repair in young piglets, which may explain the higher average daily gain observed in the treatment

group. The pre-weaning ADG was also significantly higher in the quail egg-supplemented group (178.51 g) compared to the control group (147.62 g). The treatment group showed a consistent increase in body weight throughout the trial period, with the most pronounced growth differences observed in the final two weeks before weaning. The findings of this study align with previous research on the importance of enhancing pre-weaning nutrition to support piglet growth and survival (Collins *et al.*, 2017; Huting *et al.*, 2021).

Livability. Livability rate was 96 per cent in the treatment group which was higher than the 83 per cent in the control group. The causes of death in the control group were primarily due to nutritional deficiencies and infections, while in the supplemented group, mortality was mostly associated with non-nutritional causes. The piglets that received quail egg supplementation displayed improved resilience to stress and disease, contributing to higher survival rates during the pre-weaning phase (Threadgold *et al.*, 2021). These findings corroborate that the early-life nutrition plays a crucial role in determining long-term growth and survival outcomes in piglets (Panzardi *et al.*, 2013). Quail eggs, with their high protein, vitamin, and mineral content, significantly enhanced the pre-weaning growth performance and livability of LWY crossbred piglets.

Economic Viability. The total cost incurred towards quail egg supplementation per piglet for the entire trail period was INR 150 till the weaning date. Considering the significant increase in weaning weight, the additional weight gained in supplemented groups was 1.3 kg and given @200 per kg live weight the additional income in supplemented group was INR 260. This gives a net profit of INR 110 from supplementation of quail egg from one piglet at weaning. The additional kilogram of body weight achieved with supplementation could translate into higher revenues post-weaning, especially in commercial pig farming systems where growth efficiency is a key driver of profitability. Hence the better growth achieved with quail egg supplementation proves to be a cost-effective strategy for enhancing growth performance in suckling piglets.

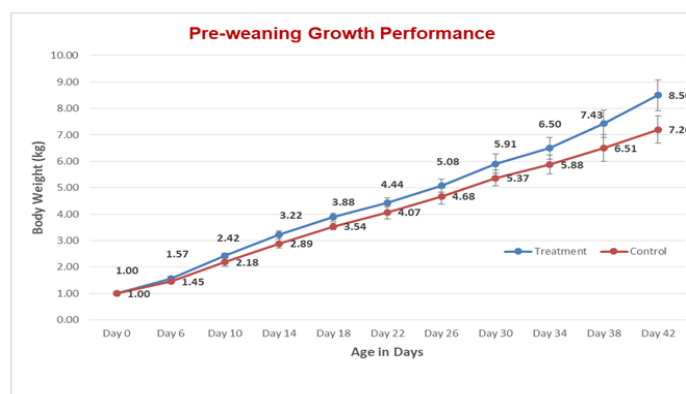


Fig. 1. Graph showing pre-weaning growth performance among treatment and control groups.

Table 1: Growth performance at different intervals between treatment and control groups.

Age in Days	Treatment group body weight (kg) (n=15)	Control group body weight (kg) (n=15)	Significance
Day 0	1.00±0.05	0.99±0.02	NS
Day 6	1.57±0.07	1.45±0.06	NS
Day 10	2.42±0.10	2.18±0.15	NS
Day 14	3.22±0.15	2.88±0.17	*
Day 18	3.88±0.15	3.54±0.12	*
Day 22	4.44±0.17	4.07±0.24	NS
Day 26	5.08±0.24	4.68±0.30	NS
Day 30	5.91±0.37	5.37±0.29	NS
Day 34	6.50±0.41	5.88±0.36	NS
Day 38	7.43±0.52	6.50±0.50	NS
Day 42	8.50±0.59	7.20±0.52	*

NS – Non Significant ; * - Significant at p<0.05

CONCLUSIONS

Quail egg supplementation significantly improved pre-weaning growth performance in the suckling LWY crossbreed piglets. This could translate into higher weaning rates and greater profitability for the pig producers. The reduction in pre-weaning mortality can be attributed to the improved immune function associated with better nutrition. In terms of economic feasibility, the relatively low cost of quail egg supplementation combined with the significant growth and livability improvements make it a viable option for pig farmers. This study highlights the potential of quail eggs as a cost-effective, nutrient-dense supplement that can enhance the survivability and growth of piglets during their critical early life stages.

FUTURE SCOPE

Further research is recommended to explore long-term effects and to evaluate the economic feasibility of quail egg supplementation in larger commercial settings. With the validation of this feeding trial at the different management conditions and farm levels, lyophilized quail eggs could be made commercially available for easy utilization and availability to the pig breeding farms.

Acknowledgement. The authors are highly thankful to Tamil Nadu Veterinary and Animal Sciences University, Chennai for conduct of this research programme and All India Coordinated Research Project on Pig for supporting the research.

Conflict of Interest. None.

REFERENCES

- Ali, M. A. and Abd El-Aziz, A. A. (2019). Comparative study on nutritional value of quail and chicken eggs. *J. Res. Field Specif. Edu.*, 15(14), 39-56.
- Collins, C. L., Pluske, J. R., Morrison, R. S., McDonald, T. N., Smits, R. J., Henman, D. J. and Dunshea, F. R. (2017). Post-weaning and whole-of-life performance of pigs is determined by live weight at weaning and the complexity of the diet fed after weaning. *Animal Nutrition*, 3(4), 372-379.
- Emtyazjoo, M. and Chamani, M. (2022). Functional quails eggs using enriched spirulina during the biosorption process. *Food Science of Animal Resources*, 42(1), 34.
- Huting, A. M., Middelkoop, A., Guan, X. and Molist, F. (2021). Using nutritional strategies to shape the gastro-intestinal tracts of suckling and weaned piglets. *Animals*, 11(2), 402.
- Novotni-Dankó, G., Balogh, P., Huzsvai, L., & Györi, Z. (2015). Effect of feeding liquid milk supplement on litter performances and on sow back-fat thickness change during the suckling period. *Archives Animal Breeding*, 58(1), 229-235.
- Panzardi, A., Bernardi, M. L., Mellagi, A. P., Bierhals, T., Bortolozzo, F. P. and Wentz, I. (2013). Newborn piglet traits associated with survival and growth performance until weaning. *Preventive Veterinary Medicine*, 110(2), 206-213.
- Threadgold, T., Greenwood, E. C. and Van Wettere, W. (2021). Identifying suitable supplements to improve piglet survival during farrowing and lactation. *Animals*, 11(10), 2912.
- Tunsaringkarn, T., Tungjaroenchai, W. and Siriwong, W. (2013). Nutrient benefits of quail (*Coturnix coturnix japonica*) eggs. *International Journal of Scientific and Research Publications*, 3(5), 1-8.

How to cite this article: A. Karthikeyan, R.S. Kathiravan, M. Murugan, P. Tensingh Gnanaraj and D. Balasubramanyam (2024). Effect of Supplementation of Quail Egg on Pre Weaning Growth Performance and Livability in Large White Yorkshire Crossbred Piglets. *Biological Forum – An International Journal*, 16(10): 78-80.